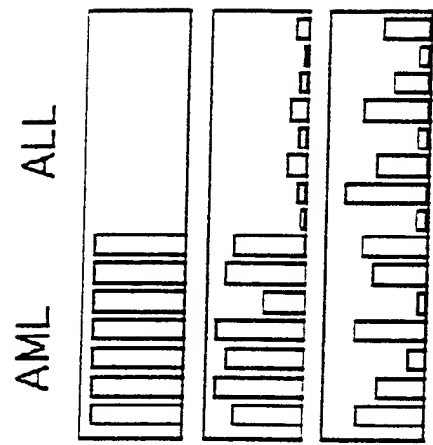


Figure 1A



$$C = (1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)$$

$$\text{gene}_1 = (e_1, e_2, e_3, \dots, e_{12})$$

$$\text{gene}_2 = (e_1, e_2, e_3, \dots, e_{12})$$

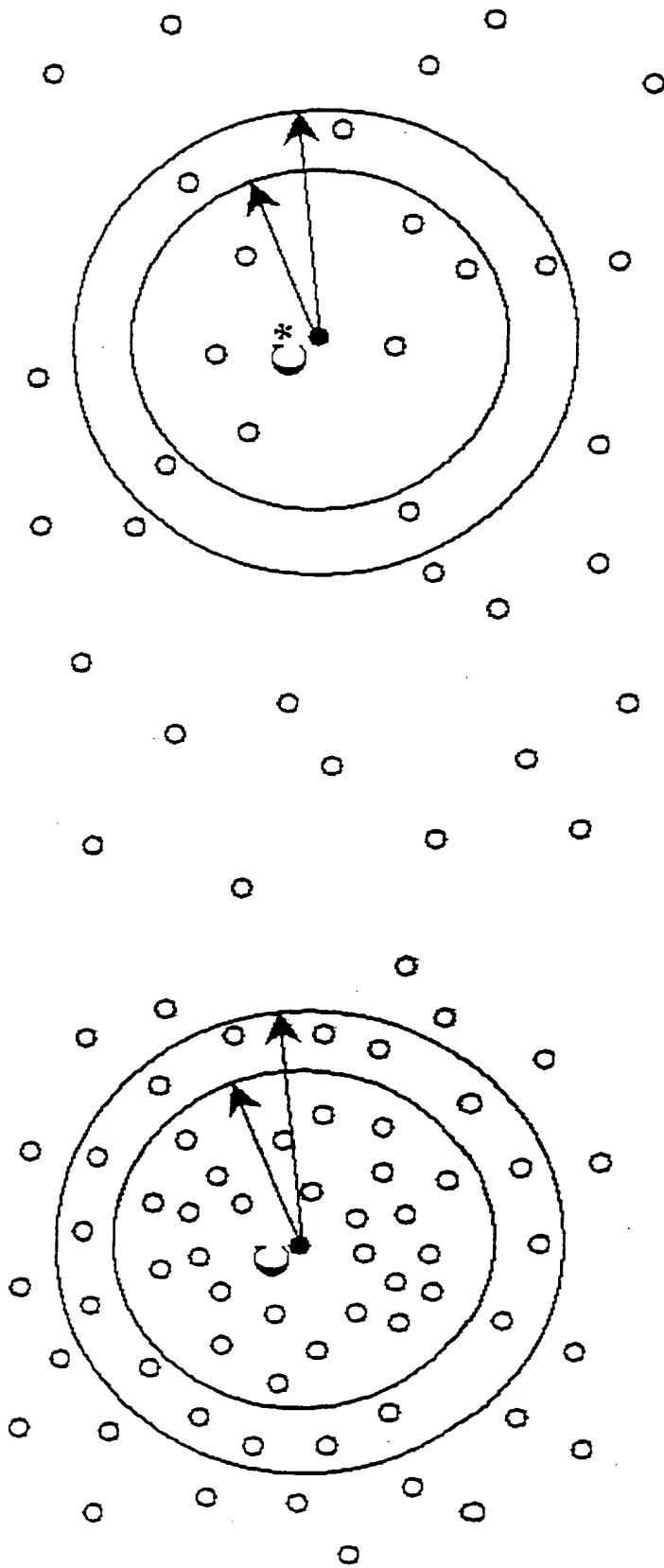


Figure 1B

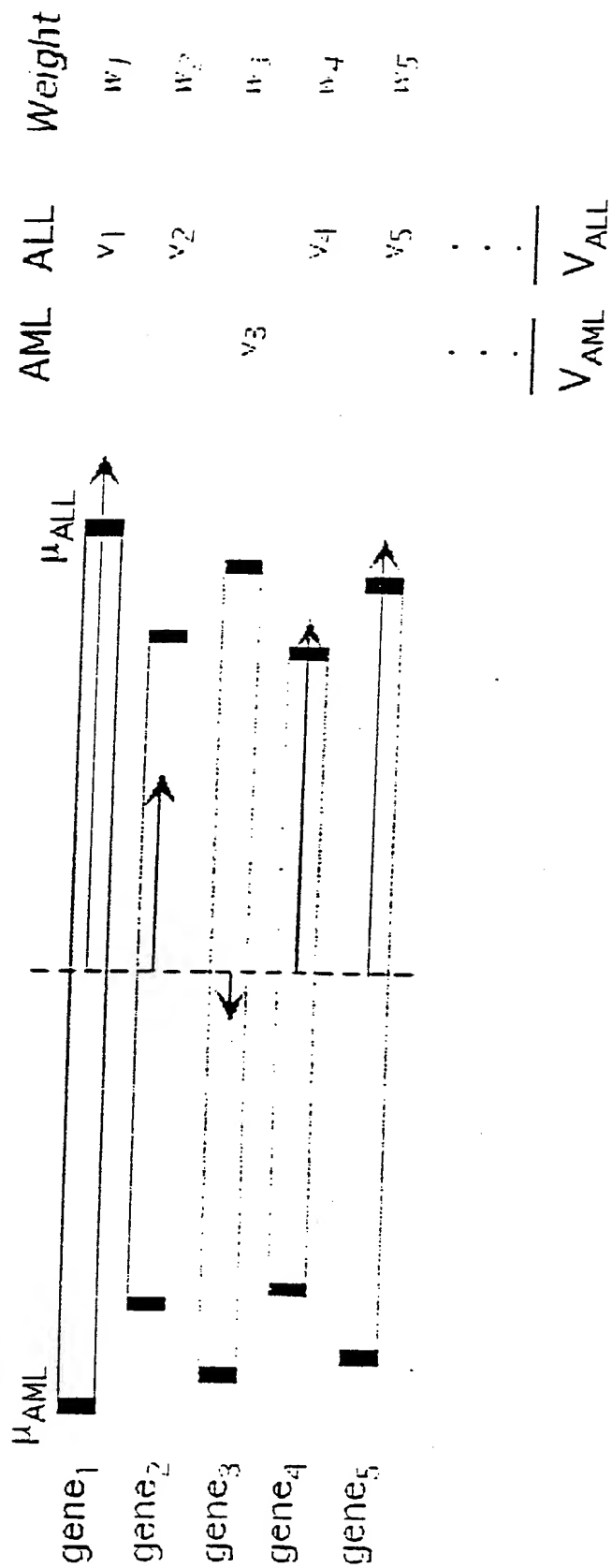


Figure 1C

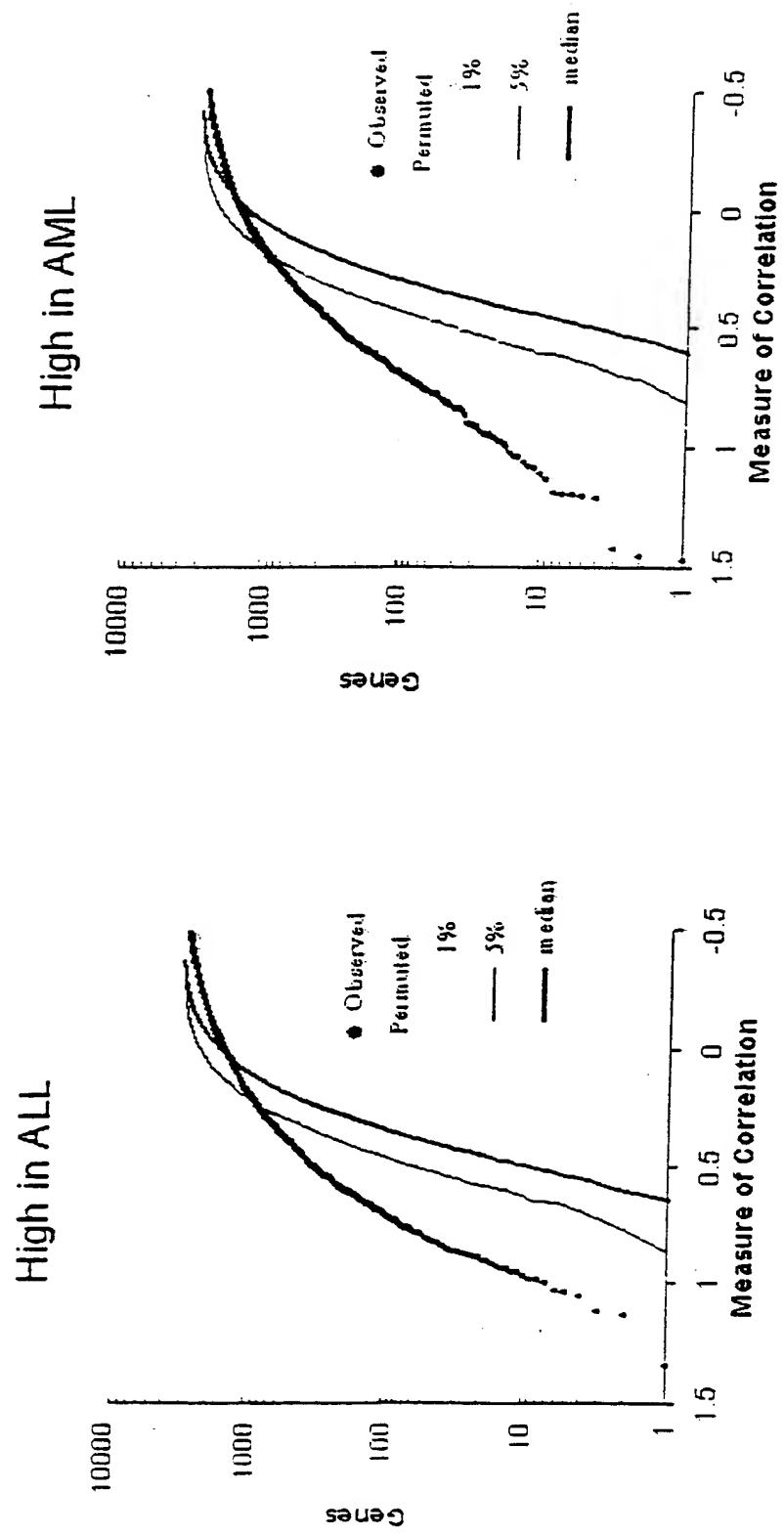


Figure 2

Fig. 3A

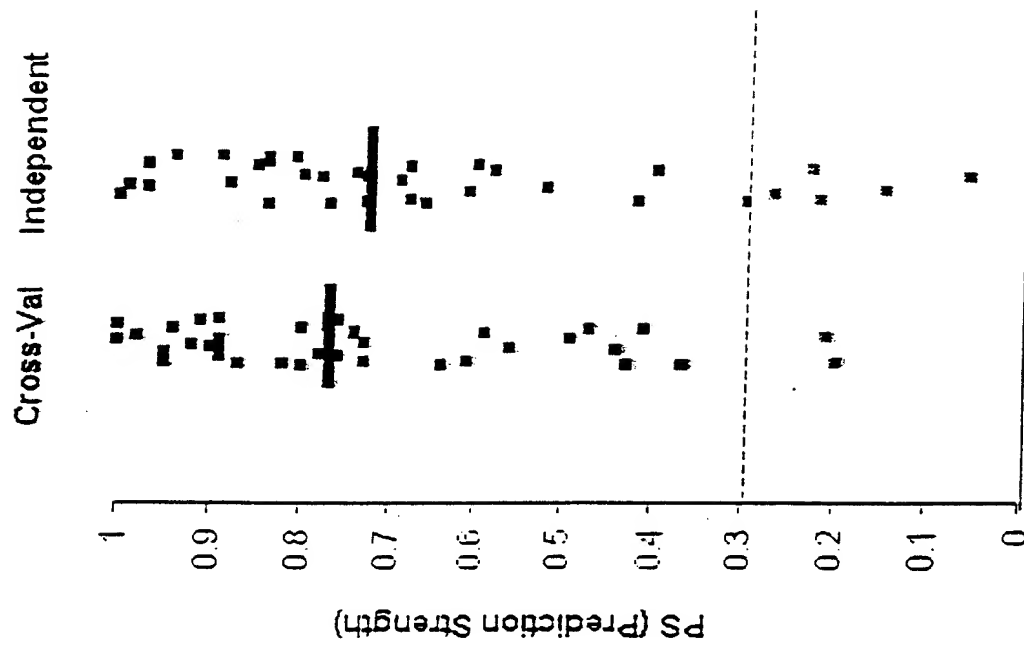
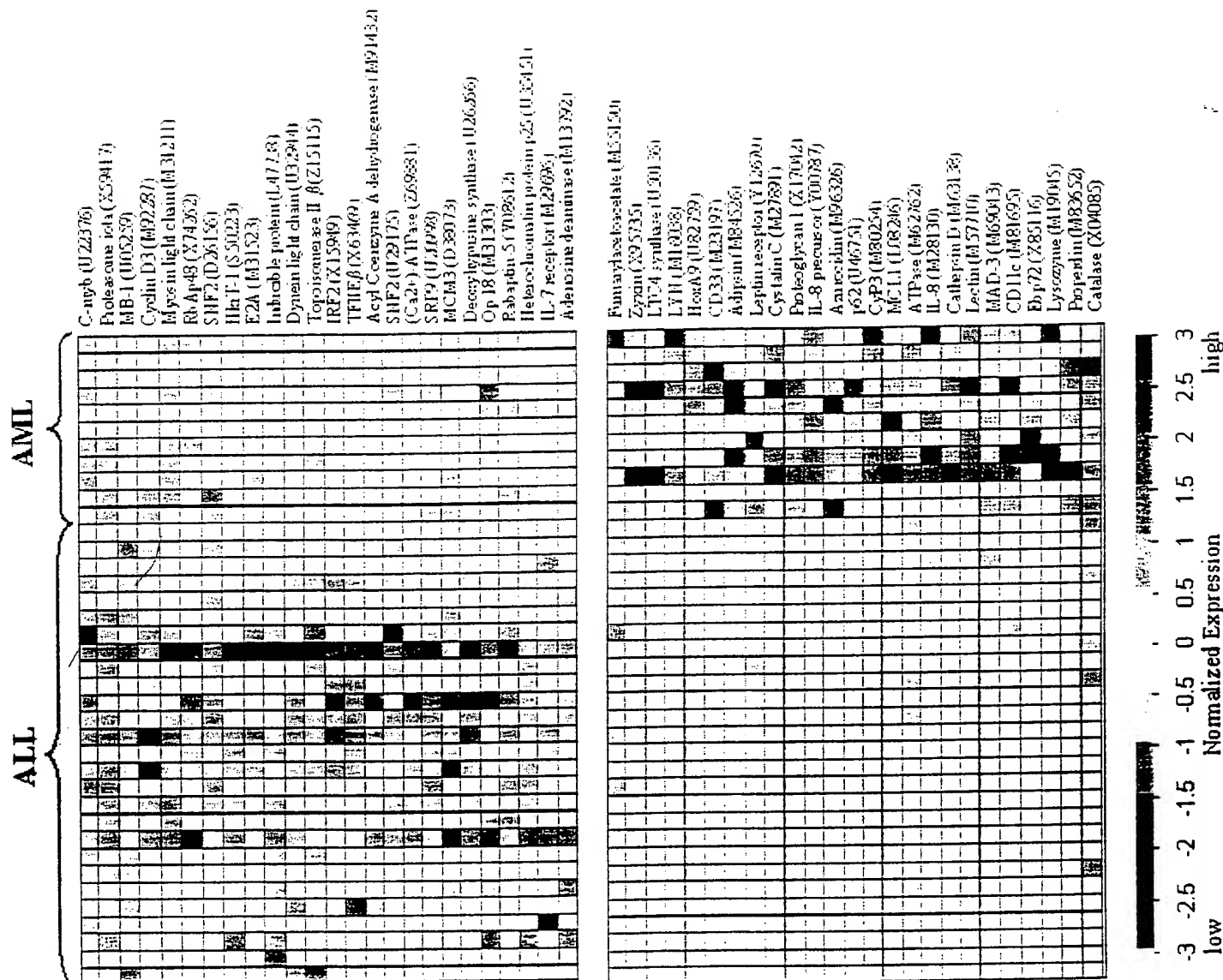


Fig. 3B



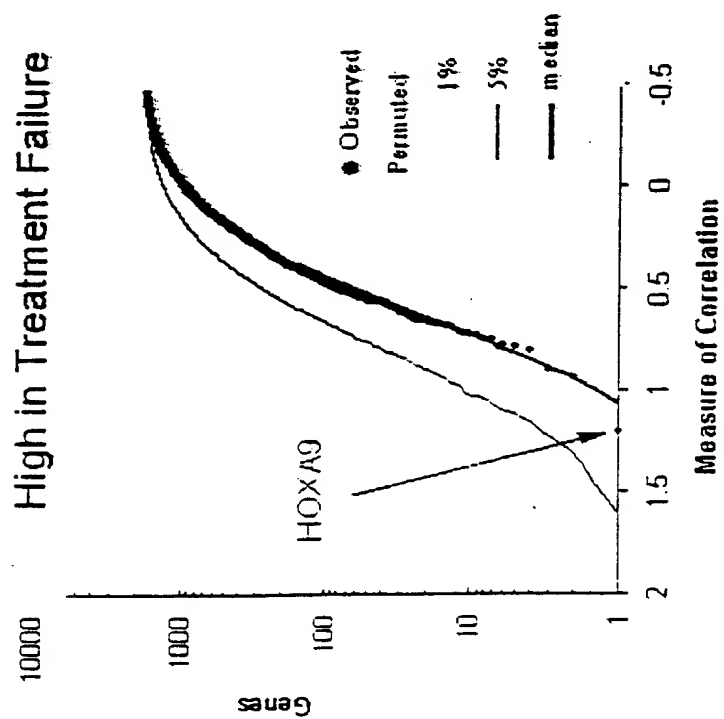
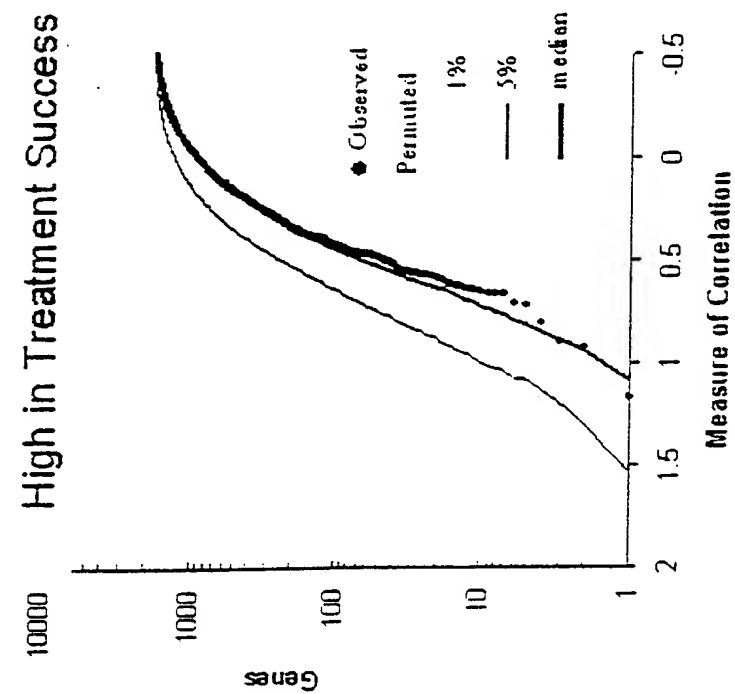


Figure 4

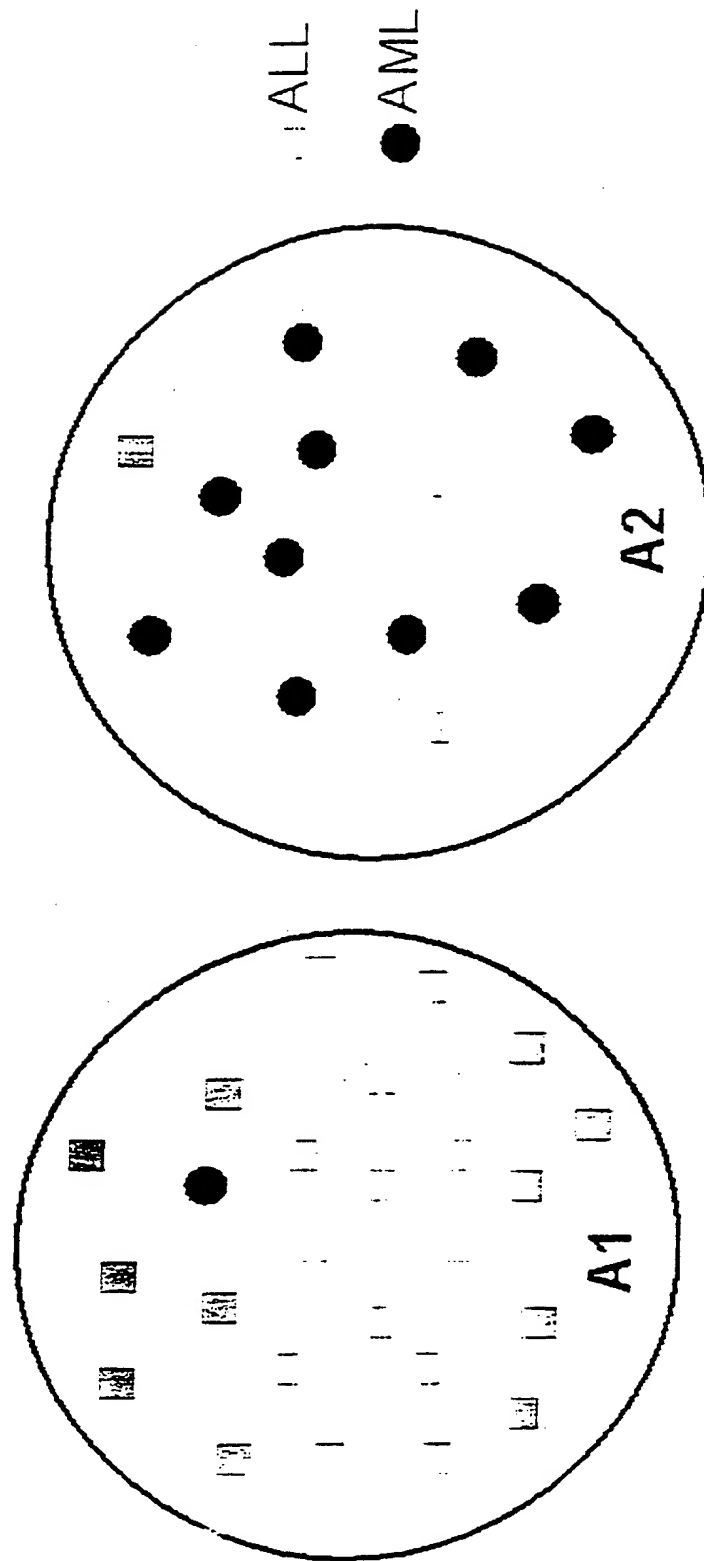


Figure 5A

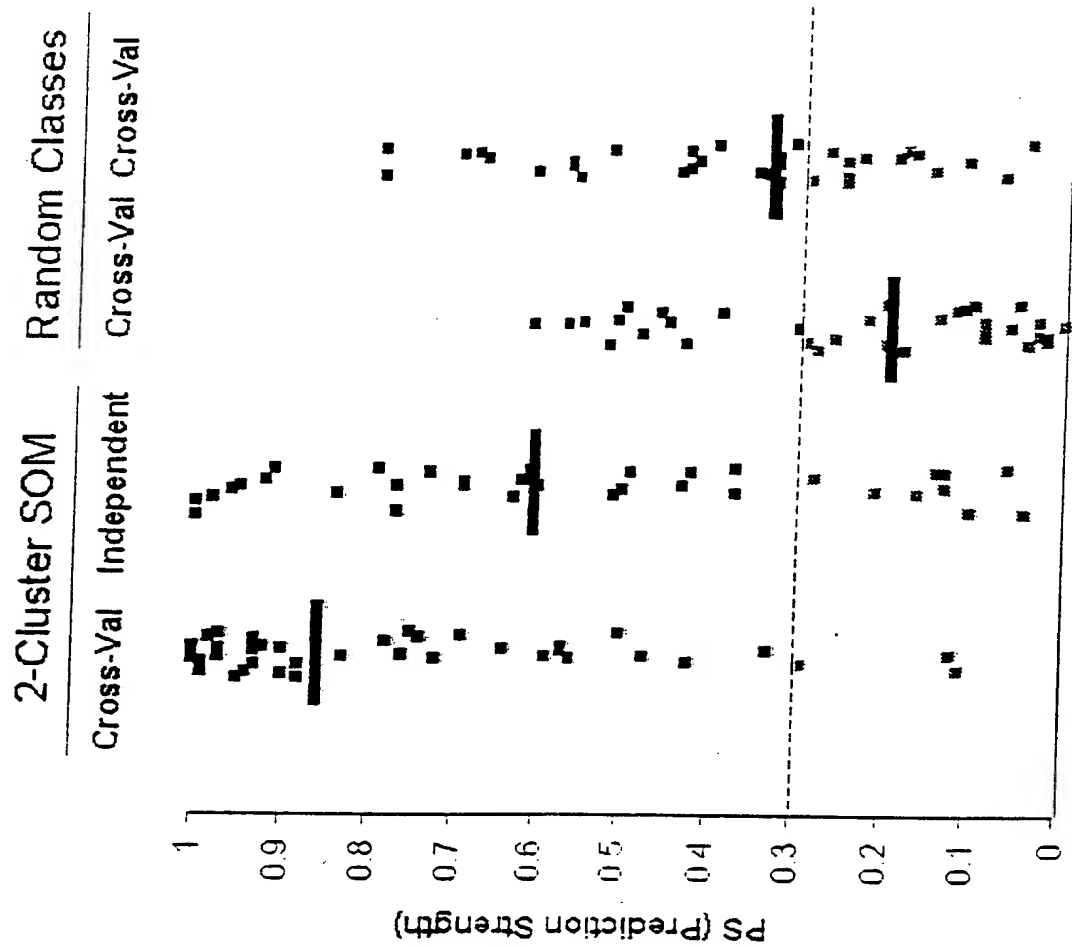


Figure 5B

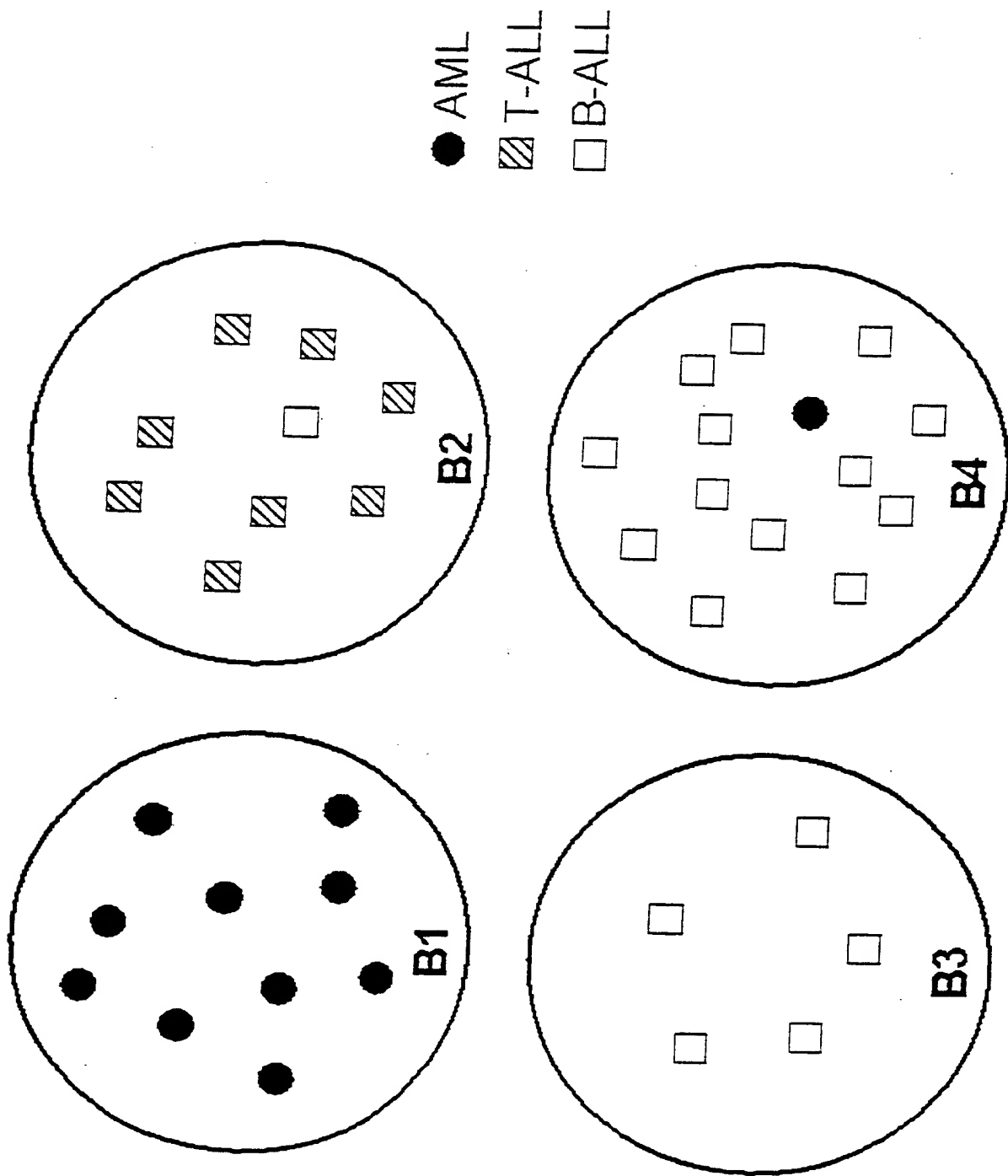


Figure 5C

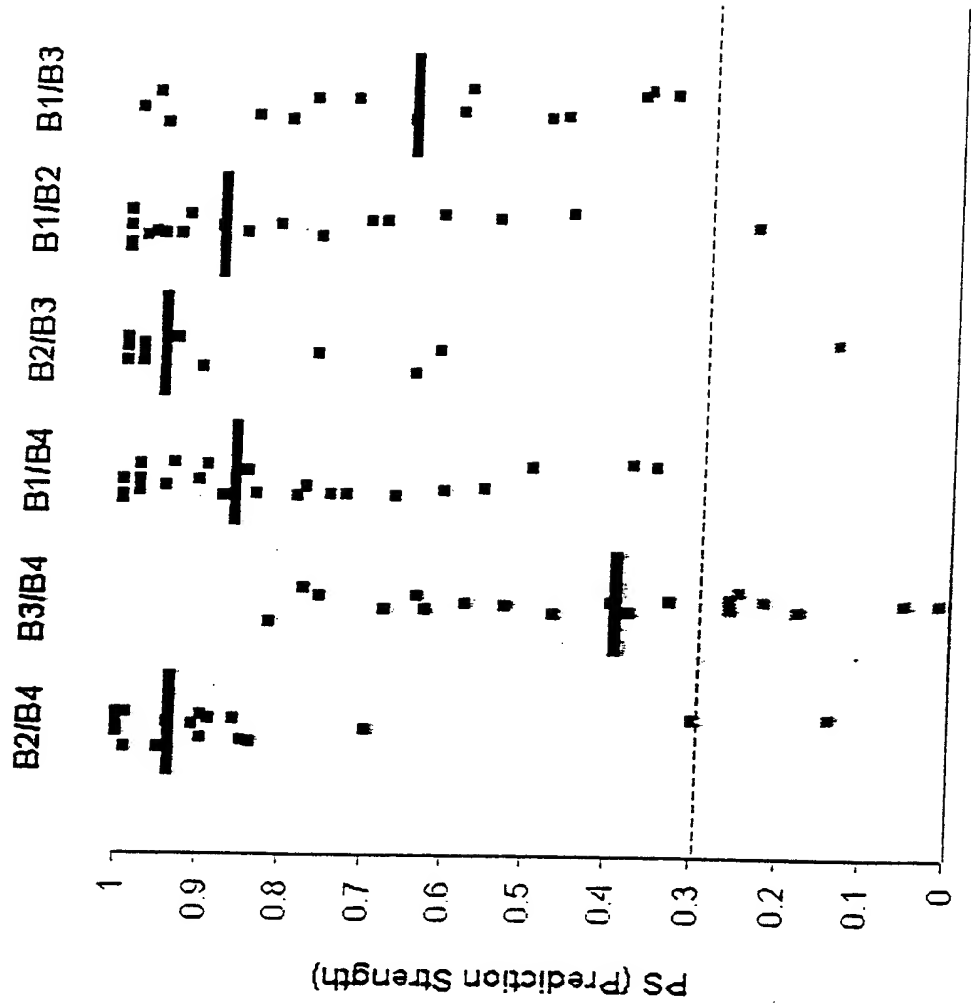


Figure 5D

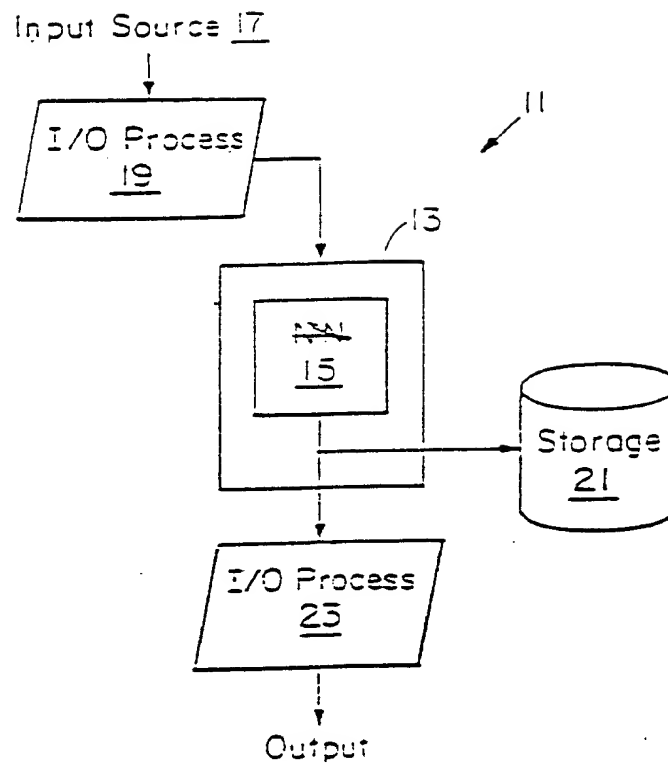


Figure 6

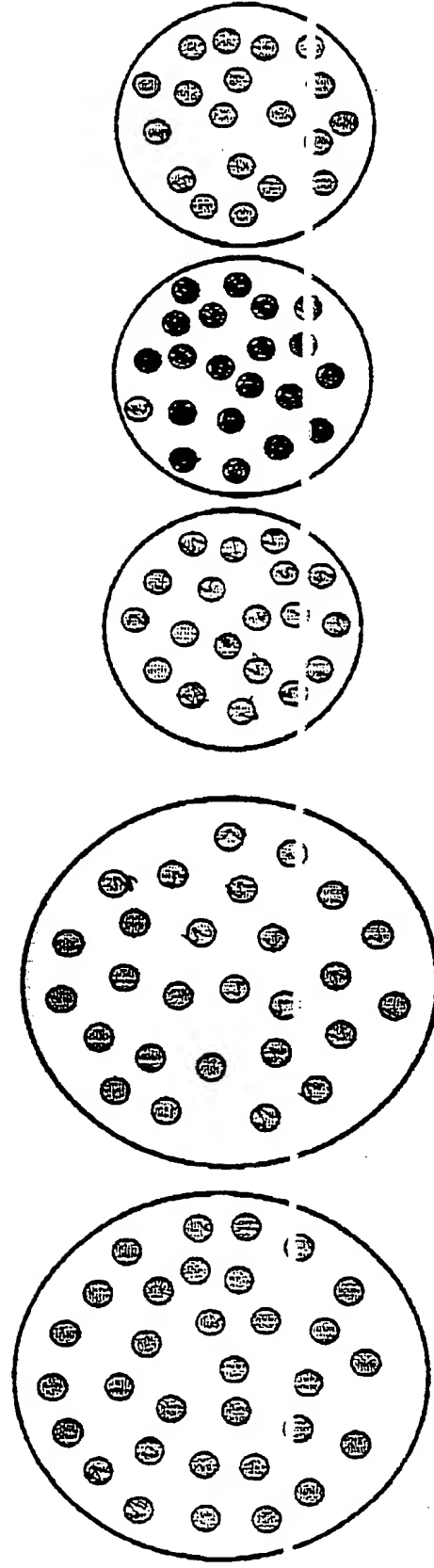
Example of Self-Organizing Map Class Discovery:

Lymphoma Large B-Cell and Follicular

Sample collection:

39 large B-Cell + 20 Follicular

Discovered Classes:



●, ⊗ Large B-Cell

⊗ Follicular

Fig. 7

Example of Self-Organizing Map Class Discovery:

Brain Glioma and Medulloblastoma

Sample collection:

24 Medulloblastomas + 15 Gliomas

Discovered Classes:

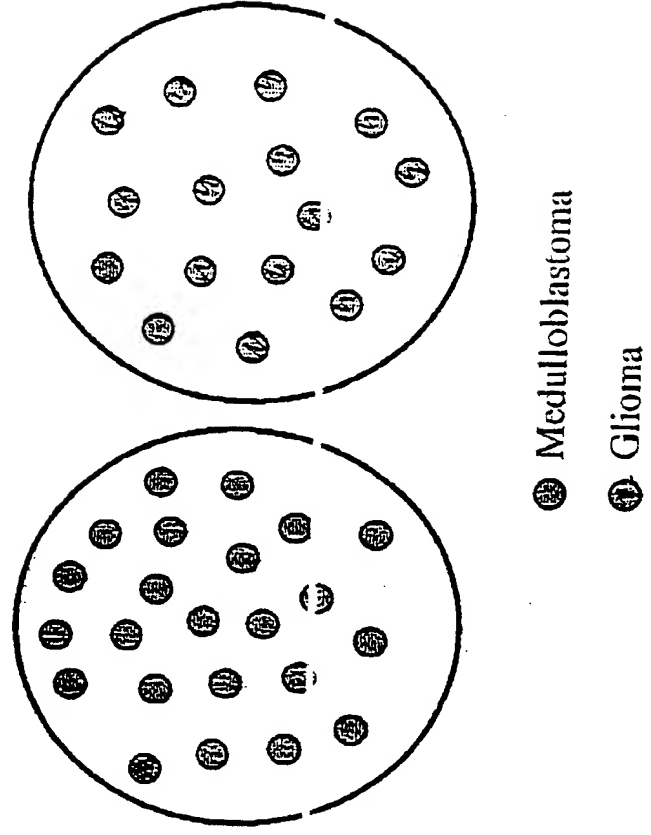


Fig. 8

Multidimensional Scaling of Leukemia Samples

(431 genes, 15-fold, $\delta > 1500$, $\text{thres} = 100$, $\text{ceil} = 16,000$)

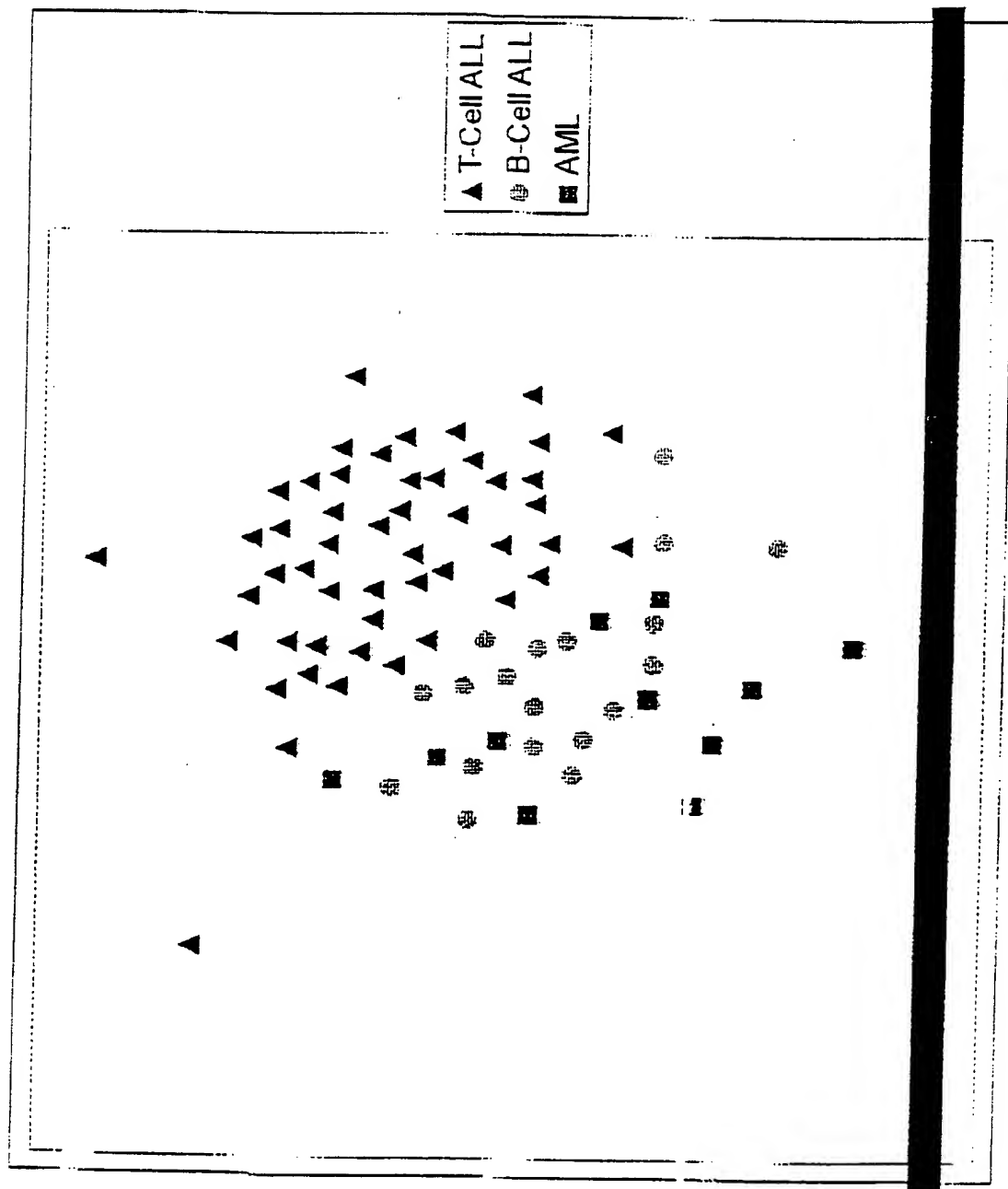


Fig. 9

Hierarchy of Problems in Molecular Class Prediction

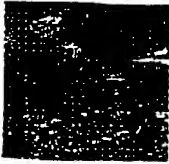
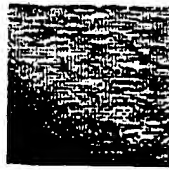






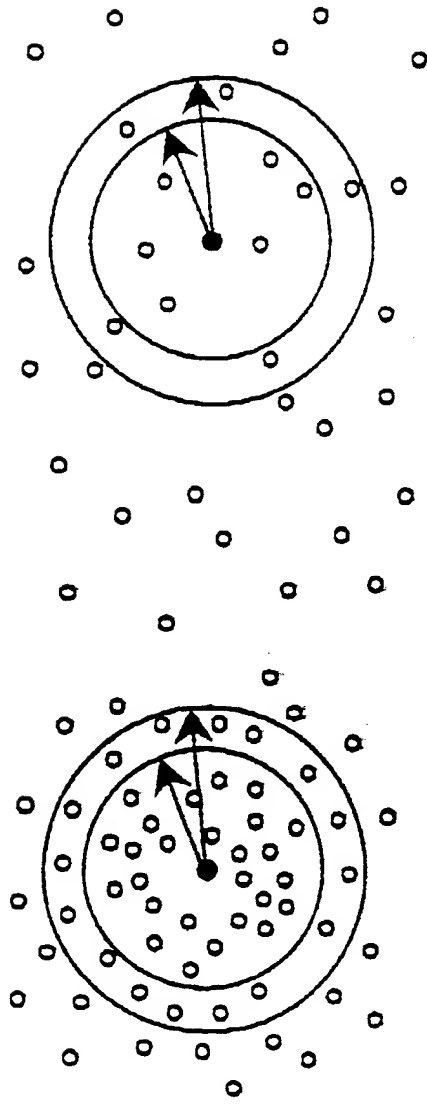
Problem:	Difficulty:	Gene Markers:	Error:	Example:
I. Tissue or Cell Type Normal vs. Abnormal	Low	~1000-2000	~0%	  Normal vs. Renal Carcinoma
II. Morphological Type	Low-medium	~200-500	~0-5%	  Leukemia ALL vs. AML
III. Morphological Subtype	Medium-high	~50-100	~0-15%	  ALL B- vs. T-Cell
IV. Treatment Outcome Drug Sensitivity	High	~1-20	~5-50%	  AML Treatment Outcome

Fig. 10

Neighborhood Analysis: Assessing Statistical Significance of

Gene-Class Correlations



Class Pattern Neighborhood

Permuted Pattern Neighborhood

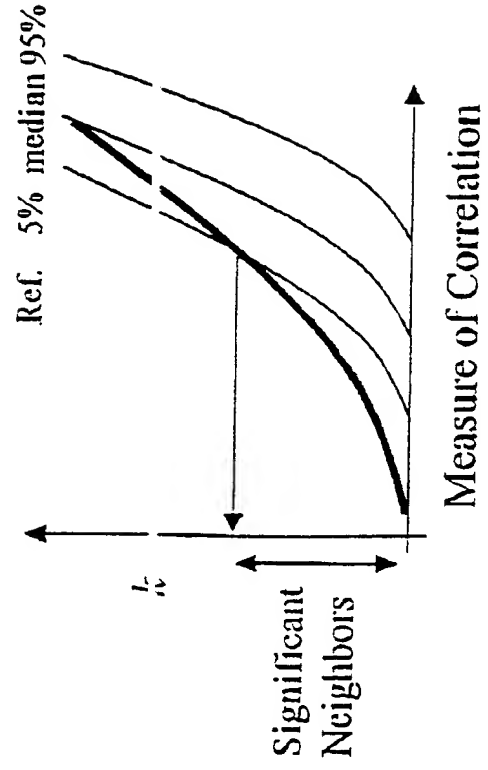
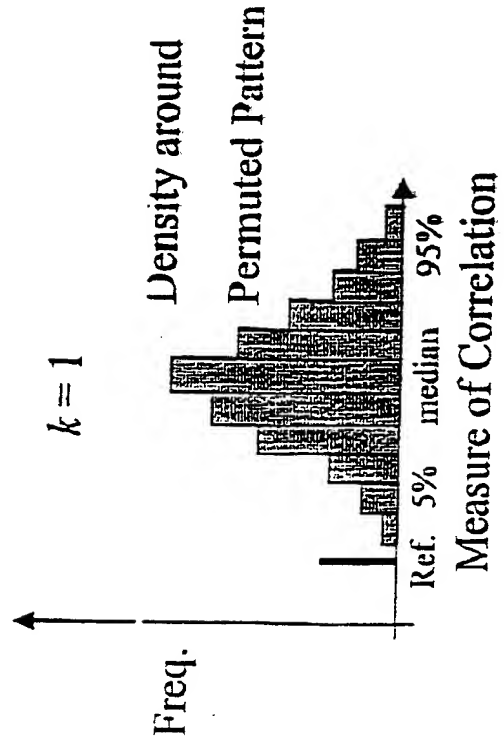


Fig. 11

Class Prediction Results

Problem Type	Biological System	Problem Definition	Number of samples	Number of errors	Number of no calls	Number of errors (all calls)	Number of generated
I	Paras	Normal vs. Cysticercus	12	0 (0%)	0	0 (0%)	>100
I	Leukemia	ALL vs. AML	85	0 (0%)	2	0 (0%)	700
I	Leukemia	ALL B vs. T Cell	33	0 (0%)	1	1 (3%)	200
ML	Leukemia	Treatment Outcome	15	2 (13%)	0	2 (13%)	1

Fig. 12